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DISINFECTANT WIPE

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(56) Prior Art Documents
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US 3227614
AU 402307 66842/66 48.3, 87.1, 25.5, 25.9

(57) Claim

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CHEMICAL ABSTRACTS SERVICE

1. A dry wipe which on contact with water provides a moist, flexible wipe for cleaning and disinfecting non-absorbent surfaces, said wipe comprising an absorbent paper substrate which is uniformly coated per square foot thereof with:

(a) from about 0.03 g to about 0.45 g of a water-soluble antimicrobial quaternary ammonium compound;

(b) from about 0.002 g to about 0.03 g of a nonionic surface active agent;
and

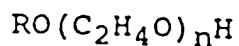
(c) from 0 g to about 0.3 g of a fragrance.

2. A dry wipe according to claim 1, wherein the paper substrate comprises from about 80% to 100% by weight of wood pulp fibers and from 0 to about 20% by weight of synthetic

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4. A dry wipe according to any one of the preceding claims, wherein the quaternary ammonium compound is a C₈₋₁₈ alkyl dimethyl benzyl ammonium chloride or C₈₋₁₈ alkyl dimethyl ethylbenzyl ammonium chloride or a mixture thereof.

6. A dry wipe according to any one of the preceding claims, wherein the nonionic surface active agent is the condensation product of an aliphatic alcohol with ethylene oxide of the formula:



wherein R is alkyl having from 8 to 22 carbon atoms and n is an integer from 3 to 40 or a mixture thereof.

ABSTRACT OF THE DISCLOSURE

A dry wipe which on contact with water provides a moist, flexible wipe for cleaning and disinfecting non-absorbent surfaces such as toilet seats, sinks and counter tops comprises an absorbent paper substrate uniformly coated per square foot thereof with from about 0.03g to about 0.45g of a water-soluble antimicrobial quaternary ammonium compound, from about 0.002g to about 0.03g of a nonionic surfactant, and from 0g to about 0.3g of a fragrance.

DISINFECTANT WIPE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a wipe for cleaning
5 and disinfecting non-absorbent surfaces, more specifically
to a dry wipe which has incorporated therein a disinfecting
agent and a surface active agent and is activated by the
user for cleaning and/or disinfecting applications by wetting
with water.

10 2. Information Disclosure Statement

In response in recent years to a need for fast
and convenient means to effect cleaning and/or disinfection
in household, personal hygiene and similar applications,
various disposable wiping articles have been suggested.

15 U.S. Patent 3,227,614 describes a disposable
germicidal or bacteriostatic paper or tissue which may
be used wet or dry to wipe surfaces to render them germicidal
or bacteriostatic. Preferred germicidal and bacteriostatic
agents are quaternary ammonium compounds including, amongst
20 others, certain alkyl dimethyl benzyl (and ethyl benzyl)
ammonium chlorides. An alcohol-type detergent as well as
certain other agents optionally can be employed. The germicid-
al and bacteriostatic agent and any optional agent is incor-
porated in the paper or tissue by treating the paper or
25 tissue with a non-aqueous vehicle in which these agents

are distributed. The alcohol-type detergent is incorporated in the treating solution in order to enhance the stability of the treating composition and is present in substantial weight excess over the quaternary ammonium compound.

5 U.S. Patent 3,786,615 discloses pre-moistened antimicrobial towels useful for sanitation purposes. The towels may be made from paper having substantial wet strength or from woven or non-woven cloth made of rayon, nylon or cotton. The preferred antimicrobial compounds are quaternary ammonium compounds, e.g., C₈-18 alkyl-substituted dimethyl benzyl ammonium chloride. A concentration of 0.1-0.2 mg. of quaternary ammonium compound per square inch of towelling is generally used.

10 U.S. Patent 4,575,891 discloses a disposable pre-moistened toilet seat disinfectant wipe for individually sanitizing a toilet seat. The wipe embodies a pad the material of which may be of fibrillated cellulose, fluffed cotton or wool fiber or disintegrated wood pulp, or of several layers of ordinary facial tissue. The disinfectant is a sanitizing solution such as an alcoholic solution, a silver nitrate solution, a diluted sodium hypochlorite solution and a mercury-zinc cyanide solution. The wipe is provided with a stiff backing and a thumb tab to provide control of the wipe by the user.

20 25 U.S. Patent 4,311,479 discloses an article for wiping soiled surfaces consisting of a substrate of cloth,

paper or other non-woven material which may be impregnated with an antimicrobial compound such as a quaternary ammonium compound, a bisquanide, an antimicrobial amphoteric surfactant and mixtures thereof and having applied thereto a dye which
5 will bond to the impregnant more than to the substrate and the disappearance whereof will indicate to the user diminution of the impregnant in the substrate. The substrate may be dried if necessary, to the extent it is dry to the touch.

10 U.S. Patent 4,476,251 discloses a polyurethane foam having cleaning and germicidal activities. The polyurethane foam is prepared from a select reaction mixture incorporating the active ingredients and includes a nonionic surfactant, a quaternary ammonium compound and a silicon based
15 surfactant. A particularly preferred embodiment employs, as the quaternary ammonium compound, a mixture of n-alkyl-(C₁₂₋₁₈)dimethyl benzyl ammonium chlorides and n-alkyl(C₁₂₋₁₈)-dimethyl ethylbenzyl ammonium chlorides.

SUMMARY OF THE INVENTION

20 Dry disinfectant wipes offer a number of advantages over pre-moistened wipes amongst which are less degradation of active ingredients, particularly the disinfecting agent, reduced shipping weight and fewer restrictions in packaging requirements, e.g., in the type of packaging material which
25 can be used.

The present invention provides an improved dry wipe which is intended for single-use and is activated for use by the addition of water. The dry wipe has distributed thereon an antimicrobial quaternary ammonium compound and a nonionic surfactant and is ideally suited for the disinfection and cleaning of soiled non-absorbent surfaces such as, e.g., toilet seats, sinks, counter tops, in a convenient and fast one-step procedure. The improvement resides in the discovery that when the quaternary ammonium compound and the nonionic surfactant are employed in the wipe in certain critical amounts, the active agents are transferred during the cleaning procedure from the moistened wipe onto the surface in amounts which are effective for cleaning and disinfection of the surface while at the same time such amounts are not so excessive as to be perceived as unsightly residues, i.e., as spots, smears or streaks, therefore precluding the need for rinsing and mechanical drying, a distinct advantage for the consumer both in terms of convenience and time.

Thus the invention provides a dry wipe which on contact with water provides a moist, flexible wipe for cleaning and disinfecting non-absorbent surfaces comprising an absorbent paper substrate which is uniformly coated per square foot thereof with:

- (a) from about 0.03g to about 0.45g
of a water-soluble antimicrobial

(b) from about 0.002g to about 0.03g of a nonionic surface active agent; and

(c) from 0g to about 0.3g of a fragrance.

5 Preferably the wipe comprises, per square foot of the paper substrate, from about 0.03g to about 0.3g of the quaternary ammonium compound and from about 0.01g to about 0.03g of the nonionic surface active agent.

10 DETAILED DESCRIPTION OF THE INVENTION
INCLUDING THE PREFERRED EMBODIMENTS

The term "dry wipe" as used herein means such a wipe devoid of any substantial amount of liquid other than such amount that may inherently be present in the paper substrate by virtue of hydrogen bonding or other attractive forces. Thus no substantial amount of liquid which is readily evaporable when exposed to ambient air at room or elevated temperatures not detrimental to the dry wipe, such as the liquids employed in the preparation of the dry wipe as more fully disclosed hereinafter, is present in the dry wipe.

20 The dry wipe is comprised of three essential components: an absorbent paper substrate, an antimicrobial quaternary ammonium compound and a nonionic surface active agent.

Paper Substrate

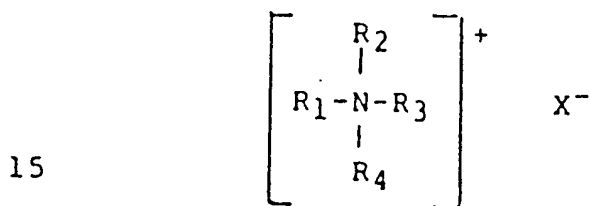
25 The paper substrate can be in any form convenient for wiping non-absorbent surfaces but is preferably in sheet-like form. It is derived from any paper stock which is produced by any of the well known manufacturing methods and which contains primarily wood pulp fibers, i.e., about

80 percent by weight or more of wood pulp fibers, the remainder of the fibers being synthetic fibers such as rayon, nylon, orlon and polyester. The paper should have a wet strength sufficient to preclude disintegration of the wipe during the surface cleaning procedure. Wet strength of varying degrees is imparted to paper by incorporating therein during manufacture appropriate amounts of a wet strength resin. However, because quaternary ammonium compounds have a certain degree of substantivity to wet strength resins, the paper employed in the invention preferably should contain an amount of wet strength resin substantially no greater than that which will provide wet strength to prevent disintegration during cleaning so as not to lead to excessive retention of the quaternary ammonium compound in the wipe. Therefore, the paper employed preferably should contain an amount of resin which provides a wet strength of less than about 30 percent, more preferably about 15 percent to 20 percent. Furthermore, although paper having these preferred wet strengths will not disintegrate during the cleaning procedure employed in accordance with the invention, nonetheless it is sufficiently disintegrable to permit convenient disposal of a used wipe by flushing down a toilet without harm to any part of the toilet system, e.g., a septic tank. The paper substrate should be capable of absorbing an amount of water sufficient to result in dissolution of a major amount of the active agents present

in the wipe in order to facilitate transfer of effective amounts of the active agents from the wipe to the surface being cleaned and disinfected.

Quaternary Ammonium Compound

5 The quaternary ammonium compound employed can be selected from any of the well known classes of antimicrobial, water-soluble quaternary ammonium compounds. Such classes include the quaternary heteronium compounds such as cetyl pyridinium chloride, polymeric quaternary ammonium
10 compounds such as those described in U.S. Patents 4,506,081 and 4,532,128, and quaternary ammonium compounds of the general formula:



wherein R_1 and R_2 are selected from an alkyl group, an alkyl ether group and a hydroxyalkyl group each containing from 1 to 3 carbon atoms, R_3 is an alkyl group containing from 6 to 20 carbon atoms, and R_4 is selected from an alkyl
20 group containing 6 to 20 carbon atoms, an aralkyl group wherein alkyl contains 1 to 2 carbon atoms and heterocyclic radicals, and X^- is a suitable anion such as halide, e.g., chloride, bromide and iodide, nitrate, methosulfate and acetate.

25 Among the quaternary ammonium compounds of the above-indicated general formula there may be specifically

mentioned the C₈-18 alkyl dimethyl benzyl ammonium chlorides and the C₈-18 alkyl dimethyl ethylbenzyl ammonium chlorides and mixtures thereof.

The amount of quaternary ammonium compound employed is critical and should be from about 0.03g to about 0.45g per square foot of the paper substrate. The specific amounts of a particular quaternary ammonium compound which may be employed within this range will depend on such factors as the antimicrobial strength thereof and substantivity thereof to the paper substrate as can be readily determined by one of ordinary skill in the art.

Nonionic Surface Active Agent

Any of the well known classes of water-soluble nonionic surface active agents can be employed in the dry wipe of the invention.

Suitable nonionic surface active agents include those selected from:

(a) the polyethylene oxide condensates of alkyl and dialkyl phenols, having a straight or branched alkyl of from about 6 to about 12 carbon atoms, with ethylene oxide wherein the amount of ethylene oxide present is from about 3 to about 25 moles per mole of alkyl phenol;

(b) the condensation products of aliphatic alcohols with ethylene oxide of the formula $RO(C_2H_4O)_nH$ wherein R is straight or branched alkyl having from about 8 to about 22 carbon atoms and n is 3 to 40. and

(c) polyoxyethylene polyoxypropylene block polymers.

Nonionic surfactants of type (a) above are marketed by GAF Corporation under the trademark Igepal®, e.g., Igepal® CA-420, an octylphenol condensed with an average of 3 moles of ethylene oxide, and by Rohm and Haas under the trademark Triton®, e.g., Triton® X-100, an octylphenol condensed with an average of 9 moles of ethylene oxide.

Nonionic surfactants of type (b) above are marketed by Shell Chemical Company under the trademark Neodol®, e.g., Neodol® 23-6.5, the condensation product of C₁₂₋₁₃ linear primary alcohol with an average of 7 moles of ethylene oxide, and Neodol 91-8, the condensation product of C₉₋₁₁ linear primary alcohol with an average of 8 moles of ethylene oxide, and by Union Carbide Corporation under the trademark Tergitol®, e.g., Tergitol® 15-S-9, a polyethylene glycol ether of a mixture of synthetic C₁₁₋₁₅ fatty alcohols with an average of nine moles of ethylene oxide.

Nonionic surfactants of type (c) above are marketed by BASF Wyandotte Corporation under the trademark Pluronic®, e.g., Pluronic® 10 R5 which conforms to the formula $\text{HO}(\text{CHCH}_3\text{CH}_2\text{O})_x(\text{CH}_2\text{CH}_2\text{O})_y(\text{CHCH}_3\text{CH}_2\text{O})_z\text{H}$ in which the average values of x, y and z are respectively 7, 22 and 7.

Nonionic fluorosurfactants can also be employed in the invention such as those marketed by E.I. Dupont de Nemours and Company under the trademark Zonyl®, e.g., Zonyl® FSN.

The amount of nonionic surface active agent employed also is critical and should be from about 0.002g to about 0.03g per square foot of the paper substrate. The specific amount of a particular surface active agent which can be employed within this range will depend on its detergent power as can be readily determined by one of ordinary skill in the art.

The dry wipe optionally, but preferably contains a fragrance for imparting a pleasant odor to the cleaned surface. As used herein, the term "fragrance" includes chemicals which can mask malodors and/or destroy malodors. When employed, the fragrance is present in the dry wipe up to about 0.3g per square foot.

Other optional ingredients also may be included in the dry wipe in small amounts in order to provide additional benefits. Such ingredients include antistatic agents for dust control and anti-fogging agents and can be included up to about 0.03g per square foot of paper substrate.

The dry wipe can be prepared by uniformly applying a solution or dispersion in a volatile liquid of the quaternary ammonium compound and the nonionic surface active agent, and any optional ingredients, if desired, to the paper substrate and then allowing the treated paper substrate to air dry either at room temperature or elevated temperatures which are not detrimental to the paper substrate or ingredients incorporated therein. The solution may be

applied by any of the known processes such as immersion of the substrate in the solution, spraying the solution onto the substrate or coating the substrate by means of a suitable applicator. Because of the relatively small amounts of the active agents which in accordance with the invention must be uniformly distributed to the paper substrate, a particularly advantageous and preferred process is one in which a printing technique using a precision engraved roll is employed, such as that described in U.S. Patent 3,786,615, incorporated herein by reference. Briefly, in that method a strip of paper to be coated is brought into contact under pressure with a precision engraved applicator suitable for gravure printing which delivers a precisely calculated amount of the solution to the paper strip. The treated sheet then is allowed to dry.

Any volatile liquid in which the ingredients to be applied are readily soluble or dispersible and which is compatible with such ingredients and the paper substrate can be used to prepare the solution or dispersion. Particularly useful are water and alcohols, e.g., ethyl alcohol, and mixtures thereof. The ingredients can be applied to the paper substrate in one step from the same solution or sequentially in separate steps from different solutions.

The dried treated paper substrate can be converted to any convenient form for use by the consumer. It can be embossed, slit, cut and folded into appropriate configurations for packaging. Thus it may be packaged in individual
5 towelette form or well known bulk towelette form from which individual towelettes can be dispensed such as a web of the dry treated paper substrate of suitable width and perforated transversely such as to readily permit sequential detachment of single towelettes.

10 The dry wipes may be packaged for use by any of a number of well known methods. As will be appreciated, because the wipes are dry, moisture impervious packaging material is not required although, in some circumstances, such packaging material may be indicated, e.g., in hot
15 humid climates where the dry wipe might absorb an undesirable amount of moisture from the atmosphere.

The dry wipe is activated for use by wetting the wipe with water up to the limit of its water-absorbancy. Disinfection and cleaning of a surface is accomplished
20 by rubbing the moistened wipe over the surface using sufficient hand pressure to express most of the absorbed water carrying effective amounts of the active agents onto the surface and allowing the cleaned surface to dry during which time disinfection proceeds to completion. The used
25 wipe is then disposed of and no further cleaning steps

are required because by virtue of the critical amounts of the active agents employed in the dry wipe, as described hereinbefore, substantially no unsightly streaking, smearing or spotting will occur.

5 The following non-limitive examples are illustrative of the invention.

EXAMPLE 1

Two solutions were prepared having the following compositions:

| | | |
|----|----------------------------------|-----------|
| 10 | Solution A | |
| | Quaternary Ammonium Compound(a) | 26.0 wt-% |
| | Nonionic Surface Active Agent(b) | 3.3 wt-% |
| | Water | 70.7 wt-% |

15 (a) n-Alkyl(60% C₁₄, 30% C₁₆, 5% C₁₂, 5% C₁₈) dimethyl benzyl ammonium chlorides and n-alkyl (68% C₁₂, 32% C₁₄) dimethyl ethylbenzyl ammonium chloride (1:1) available as a 50% solution from Onyx Chemical Company under the designation BTC 2125M.

(b) Tergitol® 15-S-9 described hereinbefore..

| | | |
|----|--------------------------|-----------|
| 20 | Solution B | |
| | Fragrance | 13.0 wt-% |
| | Ethyl Alcohol (SD40;95%) | 87.0 wt-% |

25 Solutions A and B were applied sequentially to a paper substrate by means of a flexographic printing method similar to that described hereinbefore using conventional equipment. The paper substrate employed was Port Huron 28# Blue, a blue, semi-creped paper toweling derived entirely of chemical wood pulp and having a thickness of 8 to 9 mils and a basis weight of approximately 28 pounds per ream (3000 square feet), i.e., approximately 4.24 grams per square foot.

30

by a doctor roll rotating through the bath. A precise quantity of the solution, as predetermined by the geometry of the surface of the engraved roll, was transferred to a transfer roll (plate roll) which printed the solution onto the paper as it was passed between the plate roll and a mated impression roll. This procedure was repeated using Solution B and the treated paper was allowed to air dry. The impregnated paper then was converted to sheets each having dimensions of 8½" x 12".

The amounts of active ingredients in grams per square foot (g/ft²) incorporated in the dried impregnated paper substrate were as follows:

| | |
|-------------------------------|-----------------------|
| Quaternary Ammonium Compound | 0.08g/ft ² |
| Nonionic Surface Active Agent | 0.01g/ft ² |
| Fragrance | 0.05g/ft ² |

Examples 2 to 9

Sheets having dimensions of 8½" by 12" were prepared according to the 2-step process of Example 1 using the identical paper substrate, quaternary ammonium compound, nonionic surfactant and fragrance. The solution of fragrance employed in each case was the same as for Solution B of Example 1. Solution A of the quaternary ammonium compound (hereafter QAC) and nonionic surface active agent (hereafter SAA) in each case was as follows:

| Solution A | | | | | | | | |
|----------------|---------------------|------|------|------|------|------|------|------|
| Weight-Percent | | | | | | | | |
| Example | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| QAC | 48.8 ^(a) | 26.0 | 13.0 | 13.0 | 9.8 | 13.0 | 22.8 | 26.0 |
| SAA | 9.9 | 9.9 | 3.3 | 9.9 | 3.3 | 3.3 | 3.3 | 3.3 |
| Water | 41.3 | 64.1 | 83.7 | 77.1 | 86.9 | 83.7 | 73.9 | 70.7 |

The amounts of QAC, SAA and fragrance incorporated in the dried impregnated paper substrate in each case were as follows:

g/ft²

| | | | | | | | | |
|-----------|------|------|------|------|------|------|------|------|
| Example | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| QAC | 0.15 | 0.08 | 0.04 | 0.04 | 0.03 | 0.04 | 0.07 | 0.08 |
| SAA | 0.03 | 0.03 | 0.01 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 |
| Fragrance | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |

Example 10

Using the identical quaternary ammonium compound and nonionic surface active agent as in Example 1, two solutions were prepared as follows:

| | |
|--------------|-----------|
| Solution A | |
| QAC | 32.5 wt-% |
| SAA | 3.3 wt-% |
| Solution A-1 | |
| QAC | 32.5 wt-% |

In a four-step sequence, Solution A was applied once, Solution A-1 was applied twice and Solution B, identical to that of Example 1, was applied once to Port Huron 28# Blue paper using the flexographic printing method described in Example 1. The treated paper substrate was allowed to air dry and then was converted to 8½" x 12" sheets.

The amounts of QAC, SAA and fragrance incorporated in the dried impregnated paper substrate were as follows:

| | |
|-----------|-----------------------|
| QAC | 0.30g/ft ² |
| SAA | 0.01g/ft ² |
| Fragrance | 0.05g/ft ² |

Example 11

Using the identical QAC, SAA and fragrance as in Example 1, a solution was prepared having the following composition:

| | | |
|---|-----------|-----------|
| 5 | QAC | 26.0 wt-% |
| | SAA | 3.3 wt-% |
| | Fragrance | 16.5 wt-% |
| | Water | 54.2 wt-% |

This solution was applied to Port Huron 28# Blue 10 paper using the flexographic printing method described in Example 1. The treated paper substrate was allowed to air dry and then was converted to 8½" by 12" sheets.

The amounts of QAC, SAA and fragrance incorporated were as follows:

| | | |
|----|-----------|-----------------------|
| 15 | QAC | 0.08g/ft ² |
| | SAA | 0.01g/ft ² |
| | Fragrance | 0.05g/ft ² |

Example 12

Using the identical QAC and SAA as in Example 20 1, a solution was prepared having the following composition:

| | | |
|--|-----------|-----------|
| | QAC | 26.0 wt-% |
| | SAA | 3.3 wt-% |
| | Fragrance | 13.0 wt-% |
| | Water | 57.7 wt-% |

25 This solution was applied to Port Huron 36# Blue paper, a blue, semi-creped paper toweling derived entirely from chemical wood pulp and having a thickness of 9 mils and a basis weight of approximately 36 pounds per ream (3000 square feet), i.e., approximately 5.44 grams per 30 square foot. Application was by the flexographic printing method described in Example 1. The treated paper substrate

The amounts of QAC, SAA and fragrance incorporated were as follows:

| | |
|-------------|------------------------|
| QAC | 0.10g/ft ² |
| SAA | 0.013g/ft ² |
| 5 Fragrance | 0.05g/ft ² |

The above-exemplified dry wipes can be prepared for use by the consumer by wetting with water and squeezing the moistened wipe as it is applied to the surface to be cleaned and disinfected thereby activating the active ingredients.

A simulated use test was performed to determine the amount of QAC expressed from the wipes of Examples 1 to 12 after wetting. In this test the 8½" x 12" dry wipe is wetted with 14 ml. of water (18 ml. in the case of Example 12) and then squeezed by hand to express as much as possible of the liquid therefrom. The expressed liquid is then analyzed by a standard procedure for content of the QAC.

The results obtained are given in the following table wherein the amount of QAC is given in parts per million (ppm):

| Example | No. of Sheets Tested | ppm QAC |
|---------|----------------------|---------------------|
| 1 | 20 | 3000 to 4000 |
| 2 | 2 | 5100 and 5400 |
| 3 | 2 | 3200 and 3400 |
| 4 | 3 | 1200, 1300 and 1500 |
| 5 | 2 | 1450 and 1500 |
| 6 | 2 | 900 and 1000 |
| 7 | 2 | 1300 and 1400 |
| 8 | 2 | 2500 and 2600 |
| 9 | 2 | 2800 and 2800 |
| 10 | 2 | 10,000 and 12,000 |
| 11 | 3 | 2750, 2900 and 3200 |
| 12 | 48 | 2800 to 3400 |

The claims defining the invention are as follows:

1. A dry wipe which on contact with water provides a moist, flexible wipe for cleaning and disinfecting non-absorbent surfaces, said wipe comprising an absorbent paper substrate which is uniformly coated per square foot thereof with:

- (a) from about 0.03 g to about 0.45 g of a water-soluble antimicrobial quaternary ammonium compound;
- (b) from about 0.002 g to about 0.03 g of a nonionic surface active agent;
- and
- (c) from 0 g to about 0.3 g of a fragrance.

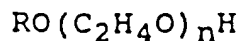
2. A dry wipe according to claim 1, wherein the paper substrate comprises from about 80% to 100% by weight of wood pulp fibers and from 0 to about 20% by weight of synthetic fibers.

3. A dry wipe according to claim 2, wherein substantially all of the fibers are wood pulp fibers.

4. A dry wipe according to any one of the preceding claims, wherein the quaternary ammonium compound is a C₈₋₁₈ alkyl dimethyl benzyl ammonium chloride or C₈₋₁₈ alkyl dimethyl ethylbenzyl ammonium chloride or a mixture thereof.

5. A dry wipe according to claim 4, wherein the quaternary ammonium compound is about a 50:50 mixture by weight of n-alkyl (60% C₁₄, 30% C₁₆, 5% C₁₂, 5% C₁₈) dimethyl benzyl ammonium chlorides and n-alkyl (68% C₁₂, 32% C₁₄) dimethyl ethylbenzyl ammonium chlorides.

6. A dry wipe according to any one of the preceding claims, wherein the nonionic surface active agent is the condensation product of an aliphatic alcohol with ethylene oxide of the formula:



wherein R is alkyl having from 8 to 22 carbon atoms and n is an integer from 3 to 40 or a mixture thereof.

7. A dry wipe according to claim 6, wherein the nonionic surface active agent is a polyethylene glycol ether

of a mixture of synthetic C₁₁₋₁₅ fatty alcohols with an average of nine moles of ethylene oxide.

8. A dry wipe according to any one of the preceding claims, comprising per square foot of the paper substrate from about 0.03 g to about 0.3 g of the quaternary ammonium compound and from about 0.01 g to about 0.03 g of the nonionic surface active agent.

9. A dry wipe according to claim 8, which comprises per square foot of the paper substrate about 0.05 g of the fragrance.

10. A dry wipe according to claim 3, comprising per square foot of the paper substrate:

- (a) about 0.08 g of a 50:50 mixture by weight of n-alkyl (60% C₁₄, 30% C₁₆, 5% C₁₂, 5% C₁₈) dimethyl benzyl ammonium chlorides and n-alkyl (68% C₁₂, 32% C₁₄) dimethyl ethylbenzyl ammonium chlorides;
- (b) about 0.01 g of a polyethylene glycol ether of a mixture of synthetic C₁₁₋₁₅ fatty alcohols with an average of nine moles of ethylene oxide; and
- (c) about 0.05 g of the fragrance.

11. A moistened wipe prepared by adding water to the dry wipe according to any one of claims 1-10 up to the limit of water absorbency of the dry wipe.

12. A dry wipe according to claim 1 or a moistened such dry wipe substantially as herein described with reference to any one of the Examples.

DATED this FIRST day of MAY 1987

STERLING DRUG INC.

Patent Attorneys for the Applicant
SPRUSON & FERGUSON



COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

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Int. Class

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Complete Specification for the invention entitled:

"DISINFECTANT WIPE"

The following statement is a full description of this invention,
including the best method of performing it known to us

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